

Maria Jodłowiec

Jagiellonian University, Kraków

Language teacher education as a complex adaptive system

Abstract

The major argument advanced in this paper is that language teacher education programmes should not so much focus on equipping prospective teachers with relevant knowledge and skills, but instead prepare candidates for the teaching profession to *generate* relevant knowledge and use the pedagogic skills that are required for a specific classroom scenario, which is neither foreseeable nor likely to be typical. The changeability and unpredictability of the world on the one hand, and the requirement that teachers should be self-directed and self-exploring individuals on the other, indicate that teacher education should be viewed as an open-ended, non-linear, and dynamic model. Therefore, it may be illuminating to analyse language teacher education in terms of complex adaptive systems, as conceptualising it in this way offers fresh insight into the outcomes that teacher educators should be working towards and provides the basis for practical implementation of the reflective, change-oriented, and deeply humanistic model of teacher development.

1. New challenges in L2 teaching and learning: the ecological perspective and action-based instruction

The age of globalisation, unprecedented migration of people, the status of English as a lingua franca, demands for plurilingual and intercultural competences seem to be just some of the most frequently mentioned factors that, over the past two decades, have exerted significant impact on English language teaching and learning in general, and EFL teacher education in particular.

In the twentieth century teacher educational science, rooted in positivist thought, advocated the transmission model of teacher development, in which teacher instructors were responsible for feeding the requisite knowledge to prospective teachers and making sure that trainees would have at their disposal an adequate repertoire of skills

and resources to be used in the classroom. On this model, teaching was approached as a top-down system, based on established preconceptions and predictions about what classroom teaching should be like, the underlying assumption being that the teacher equipped with sufficient knowledge about language teaching methodology and relevant teaching skills would be able to optimally orchestrate the pedagogic scene in order to achieve the required outcomes (cf. Freeman, Johson 1998: 399; Kumaravadivelu 2001: 550, 2003: 33). Well-defined didactic objectives, suitably chosen teaching techniques and materials, and carefully designed evaluation procedures – to refer to the most conspicuous elements involved – were identified as the major parameters that contributed to making teaching efficient, and, as a result, were supposed to lead to successful language learning.

This kind of modernist close-ended operationalisation of teacher's competences seems to have been severely undermined by new challenges that teachers have to face in the twenty-first century. Firstly, the ever-changing world speeding up in an unprecedented way recently, is constantly creating new contexts and forms for human functioning (Cook 2000: 181). This means that, in very general terms, in preparing for the future, which nowadays differs crucially from the past familiar patterns, we can no longer rely on analysing and digesting earlier developments in seeking solutions to new problems. Previous old schemes often prove so dissimilar to what the new era brings forth that in some situations not much can be learnt from looking back and scrutinising earlier experience in order to deal with novel situations.

All this has serious repercussions for language teacher education programmes. The type of social context in which teachers have to function nowadays bears little resemblance to what it used to be like. This is so not only because of new technological developments that affect teaching and learning, but also due to new attitudes and expectations that are formed. As we all know only too well, pupils (often with purple hair and pierced noses) "bring with them unprecedented social and emotional problems, together with an increasing desire for an education that will ready them for their future careers and for other practical endeavours" (Guntermann 1997: 27). With reference to teacher education this means that teacher candidates need to be prepared to deal with totally new, unpredictable situations.

What new unprecedented developments are we witnessing in the area of L2 instruction? Is it not the case that communicative methodology, with communicative competence and its satellite concepts, predominates and can be expected rule the L2 methodology world for years to come? In fact, new and unanticipated developments appear on the language pedagogy horizon all the time. Just two important and influential ideas will be briefly discussed here: the ecological approach to language acquisition (Dent 1990; van Lier 2002; Kramsch 2006, 2008) and action-based instruction (van Lier 2004, 2007).

The ecological perspective in language education emphasises the non-linear, dynamic and holistic nature of language development (Järvinen 2009), in which the process (rather than the product) of acquisition is stressed. As it is argued by

Kramsch (2008: 391–393), the leading applied linguist in this field, an ecological theory rests on five pillars, namely, *relativity of self and other* (the notion of *I* is assumed to be inherently pluralistic and contain also *others*, because of the shifting perspectives adopted by speakers and the “many voices” and multifarious vantage points that they employ while attempting to achieve required communicative outcomes in pluricultural social encounters), *emergentism* (meanings, language structures, learning outcomes, etc. are believed to *emerge* as a result of interaction of a number of variables, and should be “taken as constantly open and in flux” (Spoelman, Verspoor 2010: 534)), *unfinalisability* (language production is never finalised, as it is just a part of an infinite web of past and present conversations, dialogic moves, presentations, etc.), *timescales* (“the meanings expressed through language operate on multiple timescales, with unpredictable, often unintended, outcomes and multiple levels of reality and fiction” (Kramsch 2008: 391)), and *fractals* (language use, social encounters and communicative acts form fractal figures, so, for instance, the way language forms are employed and interact in one situation may be seen as a pattern which will be reenacted in another communicative context).

Within this framework, when functioning in plurilingual and pluricultural contexts, speakers are assumed to rely not so much on the communicative competence in the languages that they know, but employ *symbolic competence*, that is the “ability to play with various linguistic codes and with the various spatial and temporal resonances of these codes” in order to be efficient social actors in the multilingual game (Kramsch 2008: 401). As Kramsch (2008: 390) aptly puts it, “Today, language users have to navigate much less predictable exchanges in which the interlocutors use a variety of different languages and dialects for various identification purposes, and exercise symbolic power in various ways to get heard and respected. They are asked to mediate inordinately more complex encounters among interlocutors with multiple language capacities and cultural imaginations, and different social and political memories.”

Adopting this kind of open-ended perspective in language pedagogy has important consequences for classroom teaching. L2 classrooms have been re-defined recently as *communities of practice* (van Lier 2007), in which participants assume both the roles of teachers and learners at different stages of the didactic process, thus engaging in the co-production of knowledge (Graves 2008; cf. also Nižegorodcew 2009), where the teacher’s role is to make “resources available (...) , and [guide] the learner’s perception and action towards arrays of affordances that can further his or her goals” (van Lier 2007: 53). It is assumed that “the dynamism (and tension) between the planned and predictable and the improvised and unpredictable is essential in the development of true AB [action-based] pedagogy, and (...) in all pedagogy. There has to be enough predictability and security for learners not to feel lost and bewildered – and, like every culture, the classroom needs its rituals – but there must also be enough room to innovate and move in novel directions for learners to develop autonomy and fuel their intrinsic motivation” (van Lier 2007: 53).

2. Towards an open-ended teacher instruction model

As hinted at above, in order to function competently in novel, unpredictable circumstances, teachers cannot simply fall back on their previous experience or just draw from the knowledge they have accumulated, which has important consequences for teacher education. It is a misconception to focus in teacher training on what teachers should do in certain typical or potential situations; the emphasis should be on preparing them to deal with the unexpected and unforeseeable. Strictly speaking then, student teachers ought to be introduced to methods of dealing with difficulties that they have not experienced before, and stress should be put on the ability to *generate* new knowledge. The dynamism and rate of change in the world require that intelligent functioning of an individual should necessarily involve “reflection-in-action” and very quick response to new stimuli (Kwiatkowska 2008: 70–71). In order to develop desirable skills in this respect, an individual should be able to generate new ideas on the basis of familiar models and strategic analysis of the immediate context. In essence then the new kind of knowledge invaluable for teachers must be inferential in nature: the teacher must be able to create relevant interpretations and decide about the mode of functioning to be employed rather than put to operation the rule that he or she internalised in the course of studying (Kwiatkowska 2008 and *passim*). The ability to cope with the uncertain, unknown and unique by engineering solutions and accumulating in this way a body of highly subjective, personalised knowledge is an important defining characteristic of a good professional, and in particular a good teacher (Kwiatkowska 1997: 145).

It should be mentioned that uncertainty, doubt and mystery have been recognised as an important part of scientific endeavour (see, *inter alia*, Kwiatkowska 1997: 63, 148, 178 and elsewhere, Larsen-Freeman 2000: 2; Seidlhofer 2003: 1) and they necessarily need to enter the framework of teacher instruction. Reductionist positivist thinking, which valued, above all, generalised, absolute and definite statements, seems incompatible with the vision of the present and the future that is becoming apparent to us (Larsen-Freeman 2000; van Lier 2007). Thus it seems advisable for teacher educators to raise in the student teacher the awareness that the main value of humanistic science lies in providing a framework for interpretation of didactic situations and contexts, and not in supplying instructions and directives to be followed by the practitioner. This suggests that theory should make it possible for an individual to penetrate and make sense of reality, in this way fulfilling epistemological and methodological functions, and not instrumental ones (Kwiatkowska 1997: 116). Moreover, only acquaintance with theory makes deep and exploratory reflection possible, as there cannot be a reflective analysis without adequate terminological and notional basis. All this indicates that theory has an important role to play in language teacher instruction, though not as the sound and solid knowledge base to draw from, but rather as a resource to be intelligently used to contrive new techniques and generate new ideas.

3. Teacher education and complex adaptive systems

It will be argued in what follows that in order to make teacher education worthwhile and in tune with current developments in the world and fitting the new scientific paradigm, it may be insightful to view it as a *complex adaptive system*.

The idea of using the framework of complex adaptive systems in examining and modelling dynamic and multifaceted reality is not new. It has been applied in analysing economic patterns, ecosystems, meteorology and, more recently, Cook (2000) has considered its relevance in the context of second language learning, while Larsen-Freeman (2000, 2006) has discussed its usefulness in second language acquisition studies. In a similar vein, it seems illuminating to introduce this notion in the area of teacher education and look at teaching of future teachers through the lens of complex adaptive systems.

Firstly, complex adaptive systems are intrinsically *non-linear*. This, in practical terms, means that there can hardly be direct cause-effect relationships established between the elements in the system. This feature with reference to teacher education is directly related to the idea hinted at above that cause-effect linkage can rarely be traced in classroom processes (see Kramsch 2008). Even more importantly, identifying the required outcome in social functioning does not tell us much about the route that has led to achieving the effect (Cook 2000: 152) and trying to trace it may be fruitless. Establishing simple cause-effect relationships to account for complexity of teaching and learning may induce in teacher candidates the illusion of certainty, and as Dylak claims, “knowledge that something is certain may be positively dangerous for teachers, even more dangerous than a complete lack of knowledge” (1995, in Kwiatkowska 1997: 118, translation M. J.). As emphasised here more than once, it seems important to conduct pre-service teacher instruction in such a way that student teachers realise that they will be functioning in contexts characterised by uncertainty, novelty and uniqueness and their professional development will crucially depend on being able to reflect-on-action and in-action (cf. e.g. Barlett 1990; Kwiatkowska 1997, 2008). Therefore, the actual classroom teaching experience should not be regarded as the context in which the didactic theories that student teachers are supposed to get familiar with at college or university are applied, but rather as the context in which prospective as well as in-service teachers *theorise from practice* and *practice what they theorise* (Kumaravadivelu 2001, 2003, 2006). This means that the teaching practice should be viewed as creating opportunities for teachers to observe, analyse and, as a result, formulate relevant generalisations and principles about what works and what does not work well in different teaching and learning situations, at the same time giving them a chance to try out various techniques and procedures. This suggests that in teacher training the dichotomy between producing and consuming knowledge appears totally inadequate, as these two will necessarily both be involved (Kumaravadivelu 2001: 553).

Secondly, complex adaptive systems are marked by *emergence*, which means that certain behaviours and modes of functioning are assumed to emerge as a result of interaction between the elements of the system. This is precisely what is postulated about developing teacher competence: it should not be thought of in terms of the product to be achieved but rather envisaged as a process to be engaged in (see, *inter alia*, Özad 1999; Freeman 2000; Richards 2008). As Kwiatkowska (2008: 91 and *passim*) argues, we ought to think of teacher education as a never-ending process of *becoming* a professional. As it is widely postulated, developing in would-be teachers the attitude of inquiry (Larsen-Freeman 2000) and preparing them for continual life-long education (see e.g. Ellis 1990) must be one of the major goals to be achieved in teaching teachers.

Thirdly, there is the *interaction of the random and non-random* in the functioning of complex adaptive systems. It is not difficult to see teacher preparation for the profession as necessarily feeding on both spontaneity (the element of randomness) and premeditated, well-advised choices (the non-random) (see van Lier 2007). The interaction of the random and non-random is crucial for adaptability: the teacher's professional action as undertaken in the actual teaching and learning context is unique – usually untypical rather than typical – and tailored to the specific classroom circumstances.

Finally, the systems by definition are *dynamic* and *internally driven towards change*. As suggested above, teacher education must prepare student teachers for functioning in the ever-changing reality and itself change to adjust to the new paradigms of science, new social standards, new technologies, new modes of communication. The challenges of the information era and the global village world that we have entered cannot be underestimated.

4. Reflection through personalisation

Conceptualising language teacher education in terms of complex adaptive systems not only allows for a better understanding of the nature of the whole process, but may help in setting more realistic goals for pedagogic tertiary education programmes. Furthermore, it opens attractive prospects of employing instruments that might contribute to making teacher education more relevant. One of these useful instruments is personalisation, that is critical and highly subjective assessment of principles, procedures, techniques, and activities to be used in language teaching. This means that whatever future teachers are supposed to learn, whatever postulates concerning efficient teaching of the language microskills or macroskills – whether theoretical or practical – they are presented with, there must be personal-response activities initiated by the teacher educator (cf. Bakhtin's idea of *responsive understanding* as discussed in Kumaravadivelu 2001).

The primary purpose of this kind of personalisation phase should be to elicit the very personal response of each student teacher to the input that they are exposed to. In other words, student teachers must be given a chance to subjectively react to whatever they are learning about language teaching, and acknowledge it as acceptable or reject it as alien vis-à-vis their own beliefs, ideas, experiences, and private attitudes. The important feature of the personalisation procedure is that affective sphere of the audience is activated and in this way student teachers are engaged in making their own sense of the theory they are presented with (Johnson 1996: 766–767; Kumaravadivelu 2001: 541–542; Tsui 2003: 65–66; Zawadzka 2004: 60–61).

The suggestion that student teachers might react negatively to some theories or principles may not appear tolerable to some teacher instructors, but it is absolutely vital that students are given a chance to appreciate what they find appealing, but also to be critical of what they find difficult to accept. Capitalising on the realisation that teacher educators are functioning within a complex adaptive system, characterised by changeability, dynamism, non-linearity, and unpredictability, should bring it home to teachers of teachers that not everything that is taught will automatically be absorbed by student teachers, and directly included in their personal system of beliefs about good teaching. As autonomous decision-makers (cf. Nizgorodcew 1998: 268) and human agents entitled to have individual preferences, student teachers must be granted a right to subjectively assess methodologies, teaching rules or principles that they learn about.

This quality of teacher education is directly related to another vital aspect. It can hardly be denied that universities and colleges, by their nature and framework, cannot create conditions for student teachers to explore authentic classroom teaching. Student teachers' chances of reflection-on-action and reflection-in-action (cf. Schon 1983: 28–29; Szesztay 2004; Gwyn-Paquette, Tochon 2002: 207–208) are therefore severely limited. However, they can reflect on what they like or not like about a particular theory or principle, how they personally evaluate the effectiveness and plausibility of a given model, what their opinions about a piece of theoretical knowledge is, etc. The teacher educator initiating this kind of reflection in the trainees creates an educational context in which many voices are articulated and heard, and diversity, dynamism and non-linearity become the reality in university or college education of teachers.

Even though student teachers may not be involved much in real-life teaching, they may be asked to think of contexts (familiar or unfamiliar) in which a specific pedagogic rule or notion might be readily applicable, or alternatively, for which it would be inappropriate and/or counterproductive. Deliberating on received knowledge and sieving it through their own experiential and emotional frames (cf. Schlessman 1997: 777) makes teacher training intrinsically student-centred, individualised, and naturally focused on each participant's needs and wants (cf. Wysocka 2003: 42–44). Furthermore, in this way the process of turning future teachers into self-directed individuals, who will be ready to analyse the didactic context in which

they are functioning and take autonomous well-advised choices, is laid foundation for. Thus through personalisation, the desire to self-explore and self-improve (Kumaravadivelu 2001: 550), so fundamental to a good teacher, may be initiated in future practitioners. Personal space for the students' own conceptualisations and thoughtful consideration of the academic input will be thus established.

5. Conclusion

The corner-stone of the argument advanced in this paper is that exploring language teacher education through the metaphor of complex adaptive systems offers interesting insight into the outcomes that teacher educators should be working towards and how they can help student teachers acquire and practise abilities essential to generate new knowledge and employ skills suitable for a given pedagogic scenario.

By accepting that teacher education is non-linear, dynamic, and to a large degree unpredictable, teacher educators should, in the first place, see to it that prospective teachers develop instruments of making their own sense of received knowledge. Even though many teacher educators believe in providing future teachers with extensive theoretical knowledge as the main tool in successful trainee education and many student teachers assume that accumulating experiential knowledge leads to developing adequate professional competence, this may not be enough to help students be successful modern teachers. Only the individual who has developed a personal attitude to theory can critically approach it, and deliberately accept or consciously reject it. Student teachers must be made responsible for their education and they need to be made aware of this very fact, as ultimately, teacher education must be seen as a life-long process of self-education (cf. Bailey *et al.* 1998: 555; Wysocka 2003: 16).

From the perspective of teacher educators, accepting the idea that language teacher education is a complex adaptive system opens the possibility of adopting multi-paradigmatic perspective in instruction (cf. Niżegorodcew 2007: 23) and getting some interesting insights into how teachers should learn to teach. This even though challenging and difficult – to paraphrase Guntermann's words (1997: 26) – should be less difficult than moving the cemetery.

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